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Docket No.: M4065.0858/P858
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Michael Kaplinsky

Application No.: 09/209,982 | Confirmation No.: 6236

Filed: December 9, 1998 | Art Unit: 2622

For: COLOR CORRECTION OF MULTIPLE COLORS USING A CALIBRATED TECHNIQUE | Examiner: J.M. Villecco

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Notification of Non-Compliant Appeal Brief dated February 5, 2007, included is a concise explanation of the subject matter defined in each independent claim cited in the Appeal Brief dated December 19, 2006.

Remarks begin on page 2 of this paper.

Appendix including a Replacement Section for SUMMARY OF CLAIMED SUBJECT MATTER follows page 2 of this paper.

REMARKS

In response to the Notification of Non-Compliant Appeal Brief, Appellant submits the included replacement section for the "Summary of Claimed Subject Matter" section of the Appeal Brief filed on December 19, 2006. Appellant respectfully submits that this replacement section is now in compliance with 37 CFR 41.37(c)(1)(v). In accordance with M.P.E.P. § 1205.03(B), the entire Brief is not resubmitted, but only a replacement "Summary" section is included.

Dated: March 5, 2007

Respectfully submitted,

By _____

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SUMMARY OF CLAIMED SUBJECT MATTER

The claimed invention relates generally to an image correction method and system for correcting a plurality of colors. Abstract. Color correction of an image shown on an image rendering device is desired because the spectral sensitivity of the human eye viewing these images is different than the spectral sensitivities of color imagers. Specification at page 2, lines 4-6. This can cause the colors of an image to appear distorted when viewed by the human eye. Typical color correction methods account for only the primary colors (e.g., red, green and blue) of an image. Specification at page 3, lines 15-16. The invention, on the other hand, is able to correct for a plurality of desired colors, such as for example, the twenty four colors of a test color calibration chart 200. Specification at page 4, lines 1-2. The methods and apparatus of the invention are used to determine a color correction matrix 206 which is, in turn, used to correct the colors displayed on the image rendering device (e.g., a printer, display or monitor).

An image correction system of the invention is shown in FIG 2, reproduced below for convenience.

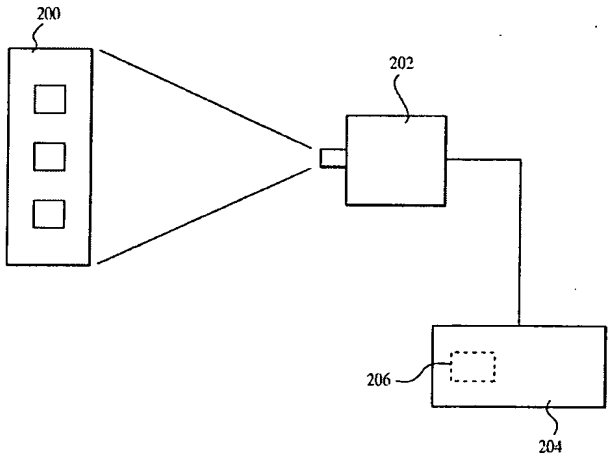

FIG. 2

A color calibration chart 200 contains a plurality of desired colors, such as white, the three primary colors and two other non-primary colors. Specification at page 7, lines 9-10. An

example of a color calibration chart 200 containing 24 colors is shown in FIG. 3, reproduced below for convenience (not shown in color herein).

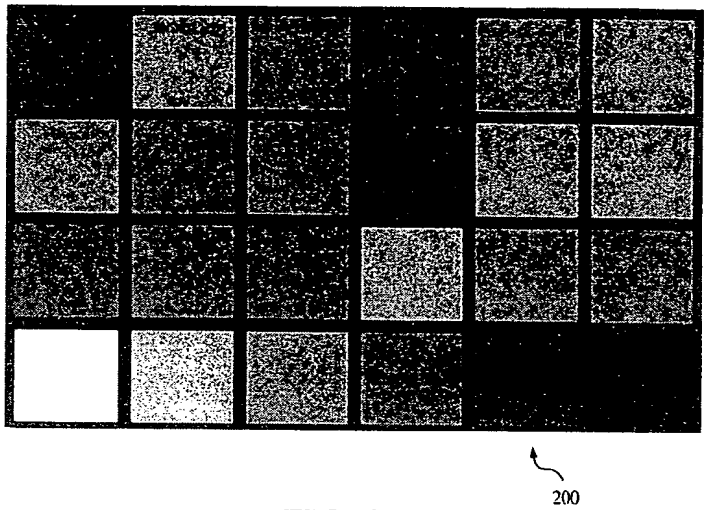

FIG. 3

A video camera 202, or more generally an imager 202, obtains an image of the color calibration chart 200. Specification at page 7, lines 13-15. To generate an optimal color correction matrix 206, the color calibration chart 200 is imaged under illumination conditions similar to those that will be used during normal operation of the imager 202. Specification at page 8, lines 14-16. The image is then processed in image processor 204. Detected signal values are recorded for each of the colors on the color calibration chart 200, one for each color channel of the imager 202. Specification at page 8, lines 17-19. For example, for an RGB imager, red, blue and green detected signal values are recorded for each of the 24 colors in color calibration chart 200.

Independent claim 1 recites an image correction method. The method of claim 1 includes obtaining expected signals for an image-rendering device of each of a plurality of known reference colors. Specification at page 7, lines 19-20; page 8, lines 4-7. The method further includes obtaining detected signals by imaging a color image array under conditions similar to those occurring during user operation of an image sensor 202. Specification at page 8, lines 14-19. The detected signals are obtained for the plurality of known reference colors. Specification at page 7, lines 9-15. The plurality of known reference colors includes white, at least three primary colors, and at least two other non-primary colors. Specification at page 7,

lines 9-11. The method further includes determining an error measure, G_E, R_E, B_E, for each of the plurality of known reference colors, the error measure being calculated by:

$$(Gn' - G_c)^2 = G_E$$

$$(Rn' - R_c)^2 = R_E$$

$$(Bn' - B_c)^2 = B_E$$

where Gn', Rn' and Bn' are expected color values and G_c, R_c and B_c are actual detected color values. Specification at page 8, line 20 – page 9, line 7. The method further includes applying a weight factor (W_i) to the error measure for each of the plurality of known reference colors to obtain a respective weighted error measure for each of the plurality of known reference colors. Specification at page 10, lines 5-17; page 11, lines 4-15. The method further includes obtaining a color correction matrix 206 by simultaneously reducing the weighted error measure for each of the plurality of known reference colors to obtain color correction for the plurality of known reference colors. Specification at page 9, lines 8-14; page 10, lines 8-22; page 12, lines 1-3.

Independent claim 6 recites an image sensor apparatus (e.g., FIG. 2). The image sensor apparatus (e.g., FIG. 2) includes an image sensor device 202, operating using a color filter array which provides color filtering such that colors transmitted to each pixel of a color image array of the image sensor device 202 are converted to signals for all color components provided by the color filtering. Specification at page 8, lines 17-19. The image sensor apparatus (e.g., FIG. 2) further includes an image processor 204 arranged and configured to color-correct images obtained by the image sensor device 202. Abstract. The images are color-corrected according to a color correction matrix 206 obtained by simultaneously reducing respective weighted error measures. Specification at page 9, lines 8-14; page 10, lines 8-22; page 12, lines 1-3. Each of the weighted error measures is calculated by applying a weight factor (W_i) to a squared difference between signals seen for a known reference color from the color image array of said image sensor device 202 and signals expected to be seen for the reference color. Specification at page 9, lines 3-7; page 8 line 20 – page 9, line 7. The color correction matrix 206 is obtained according to at least the color white, three primary colors, and at least two additional non-primary colors. Specification at page 7, lines 9-11.

Independent claim 13 recites a method of correcting an image from an image sensor 202 including a color image array having a plurality of pixels. The method of claim 6 includes obtaining signals expected to be seen for each of a plurality of known reference colors. Specification at page 7, lines 19-20; page 8, lines 4-7. The method further includes obtaining a color correction matrix 206 for the pixels, the color correction matrix 206 being one which takes into account correction for at least the color white, three primary colors, and two other non-primary colors. Specification at page 7, lines 9-11. The color correction matrix 206 is determined by simultaneously reducing error measures relative to each color. Specification at page 9, lines 8-14; page 10, lines 8-22; page 12, lines 1-3. The respective error measures for the non-primary colors are weighted such that the color correction matrix 206 corrects for some of the non-primary colors more than the primary colors. Specification at page 10, lines 5-17; page 11, lines 4-15. Each error measure represents a squared difference between signals actually seen for a known reference color from the color image array and the signals expected to be seen for each of the reference outputs. Specification at page 9, lines 3-7.